

### **Amendments to the Drawings**

Please replace the prior version of the corresponding drawing sheet with the replacement sheet enclosed with this paper. **FIG. 2** has been amended by adding a second component indicated in dashed line and with reference numeral **21**. Support for the second component can be found in the specification, including in paragraphs **[0022]** and **[0023]** and in claims 12 and 24. Reference number **24** which had been previously omitted has also been added to **FIG. 2**, support for it can be found in paragraph **[0021]**. Approval of the replacement sheet is respectfully requested.

### **REMARKS**

Reconsideration is respectfully requested. Claims 1-29 are in the case. Claims 1-28 stand rejected. Claims 28 and 29 are new. No new matter has been added.

#### **Amendments to the Written Specification**

Paragraph [0022] has been amended to add reference numeral 21 which has been added to FIG. 2. No new matter has been added. Support can be found in the claims and in the written description, in particular paragraphs [0022] and [0023], and in claims 12 and 24. Paragraph [0023] has been amended to fix a typographical error.

#### **Amendments to the Drawings**

FIG. 2 has been amended to clarify various embodiments, in particular the embodiments which include a second component on the second side. A second component is now indicated in dashed line and with reference numeral 21. Reference number 24 which had been previously omitted has also been added to FIG. 2.

#### **Claim Amendments**

Claims 1 and 13 have been amended. Claims 2, 6-8, 10-12, 14, 19-20, and 22-26 have been amended to provide clarification, and/or proper antecedent basis.

#### **Claim Objections**

The examiner has objected to claim 2 stating "couple" should be changed to "coupled". The applicant has amended claim 2 accordingly and has amended claim 14 similarly.

#### **Claim Rejections – 35 USC § 112**

The examiner has rejected claim 12 under – 35 USC § 112 second paragraph as being indefinite for failing to particularly point out and distinctively claim the subject matter which applicant regards as the invention. The examiner states the claim is

incomplete for omitting essential structural cooperative relationship of elements. Claim 12 has been amended. The applicant the claim in its present form overcomes the rejection.

### **Claim Rejections – 35 USC § 102**

The Examiner has rejected claims 1-3, 7-12, and 25-27 under 35 USC 102(b) as being anticipated by Hitoshi Japan Patent JP02003258467A. Applicants respectfully traverse. The claims are not anticipated. It is well settled that “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” See MPEP 2131. Claim 1 now reads as follows:

1. (Currently amended) A thermal management apparatus, comprising:  
a carrier substrate having a first side and an opposite second side and an opening extending from the first side to the second side; and  
a protective cover disposed to substantially enclose the first side; and  
a thermal conductor dimensioned to fit in the opening to facilitate transfer of heat generated by ~~an~~ a first electronic component attached to the first side for dissipation exclusively at the second side.

And claim 25 now reads as follows:

25. (Currently amended) A thermal management method, comprising:  
providing a carrier substrate having a first side and an opposite second side and an opening extending from the first side to the second side, and ~~an~~ a first electronic component coupled to the first side;  
providing a thermal conductor dimensioned to fit in the opening to facilitate transfer of heat generated by ~~an~~ a first electronic component attached to the first side for dissipation at the second side; and  
substantially enclosing the first side with a protective cover; and  
transferring heat from the electronic component exclusively to the second side via the thermal conductor.

Hitoshi discloses a cooling structure for an electronic component which seeks to reduce component mounting height and to enhance a cooling effect. His teaching is to enhance a cooling effect, not to manage heat the way applicant has, and has claimed. Hitoshi does not teach or suggest “a protective cover disposed to substantially enclose the first side; and a thermal conductor dimensioned to fit in the opening to facilitate

transfer of heat generated by a first electronic component attached to the first side for dissipation exclusively at the second side" (underline added) as set forth in claim 1, or substantially enclosing the first side with a protective cover; and transferring heat from the electronic component exclusively to the second side via the thermal conductor" (underline added) as set forth in claim 25. Therefore at least these elements are missing from the Hitoshi reference, and independent claims 1 and 25 have not been anticipated. Reconsideration and allowance of claims 1 and 25 is respectfully requested.

Claims 2-3, and 7-12 and claims 26-27, depend directly or indirectly from respective base claims 1 and 25 correspondingly incorporating their limitations. At least by virtue of being dependent on allowable claims (as discussed) applicant respectfully requests the examiner reconsider the rejection under section 102(b) and allow claims 2-3, and 7-12, and 26-27. Further with regard to claim 12 Hitoshi provides no suggestion to place a second component on the second side.

The Examiner has rejected claims 1, 7, 13, 19 and 25 under 35 USC 102(b) as being anticipated by Yamaji et al. U.S. Patent 5,262,922. Applicants respectfully traverse.

Yamaji et al. discloses a heat radiation structure for a semiconductor device wherein a semiconductor device is attached to a printed circuit board on a first side. A heat radiation plate is attached to a second side. The printed circuit board has a hole under the device, and a heat transmissive element extends through the hole to contact a bottom side of the device, and the heat radiation plate 4.

Independent claim 1 includes the limitation "a protective cover disposed to substantially enclose the first side; and a thermal conductor dimensioned to fit in the opening to facilitate transfer of heat generated by a first electronic component attached to the first side for dissipation exclusively at the second side" (underline added). Yamaji et al. neither teaches nor suggests such an arrangement. Therefore at least these elements are missing from the Hitoshi reference, and independent claim 1 has

not been anticipated. Reconsideration and allowance of claim 1 is therefore respectfully requested.

Claim 13 now reads as follows:

13. (Currently amended) A modular platform, comprising:  
a shelf;  
a plurality of modular platform boards, at least one of the boards including a thermal management apparatus, the thermal management apparatus comprising a carrier substrate having a first side and an opposite second side and an opening extending from the first side to the second side; ~~and~~  
a protective cover disposed to substantially enclose the first side; and  
a thermal conductor dimensioned to fit in the opening to facilitate transfer of heat generated by ~~an~~ a first electronic component attached to the first side for dissipation exclusively at the second side.

No teaching or suggestion is made, Yamaji et al., to provide "a protective cover disposed to substantially enclose the first side" or "a first electronic component attached to the first side for dissipation exclusively at the second side" (underline added) as set forth in claim 13. At least these elements are missing from the Hitoshi reference, and independent claim 13 has not been anticipated. Reconsideration and allowance of claims 13 is therefore respectfully requested.

Claims 7 and 19 respectively depend from claims 1 and 13 correspondingly incorporating their limitations. At least by virtue of being dependent on an allowable claim (as discussed) applicant respectfully requests the examiner reconsider the rejection under section 102(b) and allow claims 19.

Independent claim 25 includes the limitation "substantially enclosing the first side with a protective cover; and transferring heat from the electronic component exclusively to the second side via the thermal conductor" (underline added). Yamaji et al. make no such provision nor do they suggest making a similar provision. Therefore at least this element is missing from the Hitoshi reference, and independent claims 25 have not been anticipated. Reconsideration and allowance of claim 25 is therefore respectfully requested.

### **Claim Rejections – 35 USC § 103**

The Examiner has rejected claims 4-6, under 35 USC 103(a) as being unpatentable over Hitoshi. Claims 4-6 depends from claim 1 correspondingly incorporating its limitations. At least by virtue of being dependent on an allowable claim (as discussed) applicant respectfully requests the examiner reconsider the rejection under section 103(b) and allow claims 4-6.

The Examiner has rejected claims 14-18, and 20-24 under 35 USC 103(a) as being unpatentable over Yamaji et al. in view of Hitoshi.

Claims 14-18, and 20-24 depend from claim 13 correspondingly incorporating their limitations. At least by virtue of being dependent on an allowable claim (as discussed) applicant respectfully requests the examiner reconsider the rejection under section 103(b) and allow claims 14-18, and 20-24.

### **New Claims**

New claims 28 and 29 are presented for consideration. In their present form they are believed to be in condition for allowance. Such allowance is respectfully requested.

### **Conclusion**

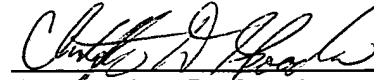
In view of the foregoing, the Applicant respectfully submits that claims 1-29 are in condition for allowance. Thus, early issuance of Notice of Allowance is respectfully requested. The Examiner is encouraged to telephone the undersigned if there are any remaining questions of patentability, and a telephone interview would be helpful in resolving these questions.

The Commissioner is hereby authorized to charge shortages or credit overpayments to Deposit Account No. 500393.

Respectfully submitted,

SCHWABE, WILLIAMSON & WYATT, P.C.

Dated: 4-21-06



Christopher D. Goodman  
Registration No. 34338

Pacwest Center, Suite 1900  
1211 SW Fifth Avenue  
Portland, Oregon 97204  
Telephone: 503-222-9981